

CLAIMS

1. Process for the controlled reduction of the sugar content of fruit juice, in particular grape juice, characterized in that it consists in subjecting at least a portion (PJO) of the original fruit juice, if desired pre-clarified, to selective ultra-filtration substantially permeable to sugars, then to a selective nano-filtration substantially impermeable to sugars, and in mixing the twice-filtered permeate (PNF) with the retentate or ultra-filtration concentrate (RUF) and, if desired, with a portion of the untreated original fruit juice (PJON), the ultra-filtration permeate (PUF) being subjected to a treatment to eliminate or limit the phenomena of crytallization or of formation of troublesome substances in the retentate or concentrate of nano-filtration (RNF).

2. Process according to claim 1, characterized in that it comprises essentially the steps consisting in:

- removing a portion (PJO) of the original juice, if desired pre-clarified;
- subjecting said portion of removed juice (PJO) to selective ultra-filtration generating a retentate or concentrate (RUF) and a permeate (PUF), the ultra-filtration used being substantially permeable to sugars and highly impermeable to other qualitative substances of the juice, in suspension and/or dissolved in this latter;
- subjecting the ultra-filtration permeate (PUF), after its preventive treatment against the phenomena of crystallization or the formation of troublesome substances, to a selective nano-filtration generating a retentate or concentrate (RNF) and a permeate PNF, the nano-filtration

means (NF) used being highly impermeable to sugars and substantially permeable to other qualitative substances dissolved in the ultra-filtration permeate (PUF);

- mixing the retentate or ultra-filtration concentrate (RUF) and the nano-filtration permeate (PNF) with a portion of the non-removed original juice (PJON), to form a treated fruit juice (JFT) with a reduced sugar content.

3. Process according to claim 1 or 2, characterized in that, for given types of ultra-filtration means (UF) and nano-filtration means (NF), the quantity of sugars eliminated, and hence the reduction of sugars in the fruit juice after treatment, are controlled by adjusting the volume of ultra-filtration permeate (PUF).

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4. Process according to any one of claims 1 to 3, characterized in that the treatment of the ultra-filtration permeate (PUF) consists in an operative step selected from the group formed by: preventive precipitation of at least one of the components taking part in or each phenomenon of crystallization or the formation of troublesome substances, by the controlled addition of at least one suitable substance in the ultra-filtration permeate (PUF); inhibition of the phenomenon or phenomena of crystallization or formation of troublesome substances by controlled addition of at least one suitable substance in the ultra-filtration permeate (PUF); limitation of the phenomenon or phenomena of crystallization or formation of troublesome substances in question by the controlled addition of at least one stabilizing product in the ultra-filtration permeate (PUF), preventing the crystallization or crystallizations or formation of troublesome substances

by controlled addition of at least one gellifying product and impoverishing, for example by treatment by means of ion exchange resins or by electro-dialysis, the ultra-filtration permeate (PUF) relative to at least one of the components taking place in the or each phenomenon of crystallization or the formation of troublesome substances in question.

5. Process according to claim 4, characterized in that said at least one added stabilizing product added to the ultra-filtration permeate (PUF) is a colloidal stabilizing product, such as for example metatartric acid, a cellulosic derivative, carboxymethylcellulose, gum arabic, xanthan gum or the like.

6. Process according to claim 4, characterized in that said at least one gellifying product added to the ultra-filtration permeate (PUF) is selected from the group formed by gelatin, alginate and the like.

7. Process according to any one of claims 1 to 6, characterized in that it consists in subjecting to a supplemental treatment operation and/or to packaging the concentrate or retentate (RNF) from the selective nano-filtration operation.

8. Process according to any one of claims 1 to 7, characterized in that it is carried out in a continuous manner, at least two of the different operative phases being carried out simultaneously and the removal being carried out during a predetermined time.

9. Process according to any one of claims 1 to 7, characterized in that it is carried out sequentially, the different operative phases being carried out one after the other by being applied to a portion of the volume of the original juice removed at the beginning of the operative cycle of the process.

10. Device for practicing the process according to any one of claims 1 to 9, characterized in that it comprises an ultra-filtration module (UF) substantially permeable to sugars and a nano-filtration module (NF) substantially impermeable to sugars, mounted in cascade, as well as means for the treatment of the ultra-filtration permeate (PUF) for the elimination or limitation of at least the phenomena of crystallization or the formation of troublesome substances in the nano-filtration retentate (RNF), the ultra-filtration module (UF) being supplied by means of removal of juice to be treated and the ultra-filtration modules (UF) and nano-filtration modules (NF) being provided with pouring means, respectively of concentrate or ultra-filtration retentate (RUF) and nano-filtration permeate (PNF).